

**Utilization of a multiaxial classification
in planning, implementing and evaluating
injury prevention**

Birthe Frimodt-Møller
Injury Surveillance Unit
National Board of Health
Amaliegade 13
P.O.Box 2020
1012 Copenhagen K
Denmark

Telephone: +45 3391 1601 * Telefax: +45 3393 1636 * E-mail: vm@sumsus.dk

Introduction

The "5-Community-Project" in Denmark was carried out in 1990-1992 as a demonstration of the community intervention model. The demonstration project was initiated by the National Board of Health in support of the Danish Government's National Health Promotion Programme. This programme gives priority to accident prevention by strengthening the intersectoral efforts to prevent traffic accidents, work-related accidents, and home and leisure accidents.

Community Intervention

is today recognized as a model for making prevention and health promotion gain impetus in the population. Prevention of injuries holds potential for tangible results in foreseeable time, compared to prevention of cancer or vascular diseases where the pay-off may be remote in time. Politicians and other decision-makers want quick rewards for their investment, and injury prevention may thus be a lever for the local community's engagement in community intervention.

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Injury prevention is, furthermore, truly a challenge for the local community, since the task requires intersectoral and interdisciplinary collaboration. The

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process is facilitated by the stepwise organization of the community's efforts - as also featured by the WHO Safe Community Programme.

A prerequisite for stimulating and motivating the local community to engage in planning and implementing injury prevention is knowledge about the local injury pattern. Equally important is the feasibility to set priorities for targeted intervention.

Method

3.

In the "5-Community-Project" local injury data were fed back to the 5 project areas from the 5 hospitals which have participated in extended injury registration since 1989. The catchment areas of these hospitals cover a total of 38 municipalities, including the 5 project areas. This population (748,000 inhabitants) is a representative sample of the Danish population.

The extended injury registration is a supplement to the National Patient Register which collects a basic data set on injuries recorded in all Danish hospitals.

4. The NOMESCO Classification of external causes of injuries, is used routinely for injury registration in Danish hospitals. The project focused on prevention of injuries following accidents of any type, cf. the objectives of the project.

5. The multiaxial structure of the Classification allows for analyses of data in virtually any desired combinations. As an example, an event can be coded as exercising sports for the victim's activity; the event can be further described by the type of sports, place of occurrence, injury mechanism, and by products involved. Any of the variables can be the starting point for a working group who wishes to delimit a specific target group in order to decide on preventive action

6. accordingly. This step in the intervention process has occasioned both professionals and citizens in the local community to become involved in the actions.

7. The evaluation was carried out by use of injury data. Data in intervention and control areas have been compared both before (1989-90) and after the intervention period (1991-92). The continued injury registration (prospective data collection) facilitates follow-up of the first evaluation performed in 1993. The follow-up evaluation (1995) has focused on the same target groups as in the first evaluation. The Poisson Regression method has been used for statistical analyses. This method can estimate the expected frequency of injuries in a target population defined by sex, age, period, geographical area, intervention/non-intervention and population size. The result is the "relative risk" which can express the increase or decrease of injury risk in relation to an index = 1, indicating the risk level before intervention. In the following examples the "relative risk" is the result of the comparison of the intervention and control area for a specific target group.

Results

The importance of using a multiaxial classification to narrow down the injury data to a specific target group is illustrated by the following examples.

8. In one project area the distribution of home and leisure accidents by age clearly indicated the need to study the injury pattern among children.

9. The incidence of injuries due to home and leisure accidents in the age group 6-18 yrs. was high at the start of the project period - and shows an increasing trend.
10. The analyses of injury data and assessment of local demographic and socio-cultural features led to local priorities regarding prevention of injuries in this age group. Sports injuries was one priority, and among the sports handball played in certain localities was targeted for preventive action.
11. When evaluating the outcome of intervention, the incidence of sports injuries appears to be unchanged. Comparison of the intervention and control area shows that the relative risk was non-significantly reduced by 6%.
12. However, the statistical analysis of handball injuries shows a significant reduction of the relative risk in the follow-up evaluation (1995). This result may be interpreted as a delayed effect of the intervention and may motivate the community to continue its efforts.

In the second example, the project workers focused on traffic injuries, and among these especially bicycle injuries in the age-group 6-16 yrs. The trend in
13. incidence of traffic injuries shows a reduction of relative risk (-23,4% (NS)) following intervention, but the effect is diminishing in the follow-up period (3,1%).

The reduction of bicycle injuries in children was a success story for this project area (in 1993), as the relative risk was significantly reduced by 54%. The trend now appears to go in the "wrong" direction. In this particular project area the prevention programme was discontinued after conclusion of the project, and time will show how this will affect the incidence of injuries.
14. The last example illustrates yet another specified target group, i.e. falls among the elderly in specified locations. The follow-up evaluation shows that the initial positive result has been sustained, but the aim to reduce the incidence of injuries further has not yet been fulfilled. The community has therefore been motivated to intensify its efforts towards this target group. Again, time will show whether the continued prevention programme reaches its goal.

Conclusions

15. The motivation of local communities to plan and implement injury prevention is strengthened, when the target group is well defined. Evaluation of the targeted intervention should similarly be based on the specified level rather than the aggregate level of injury data. Obviously, the successful outcome of intervention will sustain the motivation in the local community to focus on injury prevention. As an instrument to instigate community intervention, the multiaxial classification of external causes of injuries by far supersedes the one-dimensional structure of the ICD (the International Classification of Diseases). Promotion of the community intervention method would not be feasible by use of chapter XX in the ICD-10.

Community Intervention

A process to:

- **Increase awareness of health problems**
- **Take action to solve the problems**
- **Involve local community in actions**
- **Maintain strategy for prevention and health promotion**

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Community Organization

- **Utilize local injury data**
- **Prioritize target groups**
- **Implement targeted intervention through working groups and community participation**
- **Evaluate results of intervention**

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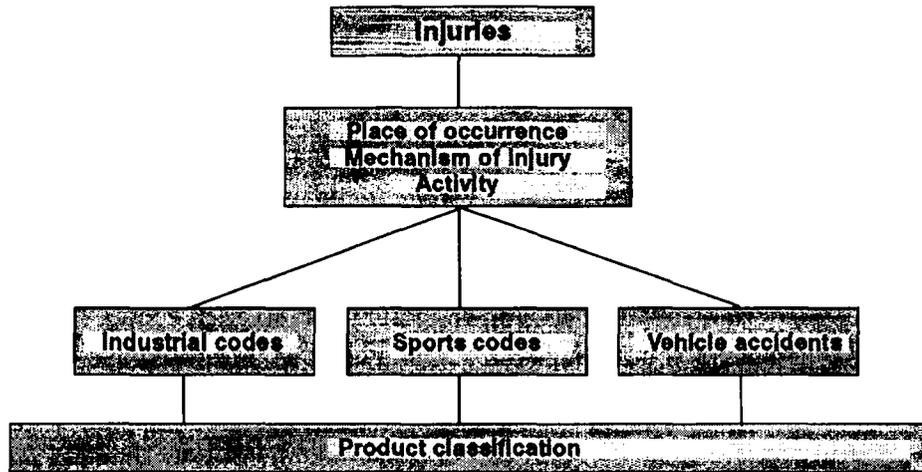
"5-Community-Project" objectives:

- **Reduce incidence of injuries due to home, leisure, occupational, and traffic accidents**
- **Strengthen intersectoral and interdisciplinary collaboration**

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MULTIAXIAL STRUCTURE

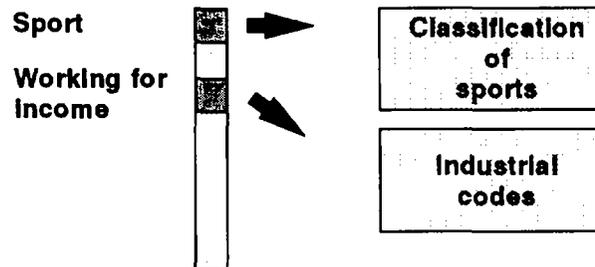
NOMESCO's Classification of external causes of injuries



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ACTIVITY

Activity codes



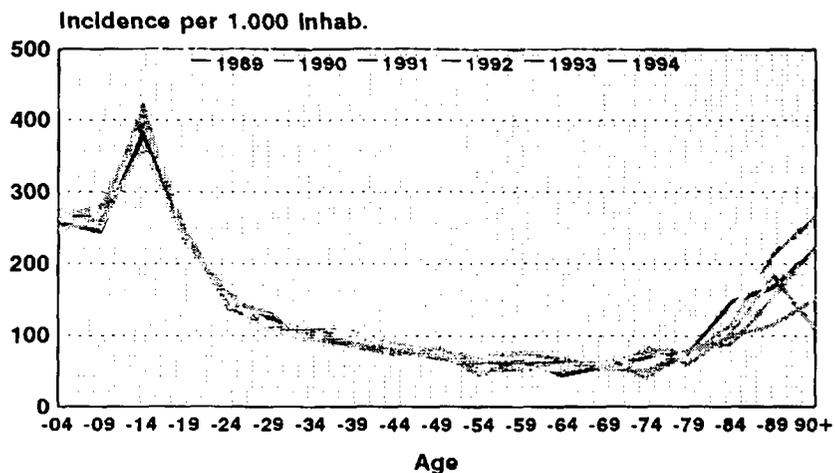
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Evaluation

- ③ **Evaluation by injury data:**
 - Comparison of intervention and control areas
 - Comparison of data before and after intervention
 - Follow-up (contd. injury registration)
- ④ **Assessment of changes in knowledge, attitudes and behaviour**
- ⑤ **Cost-benefit analysis**

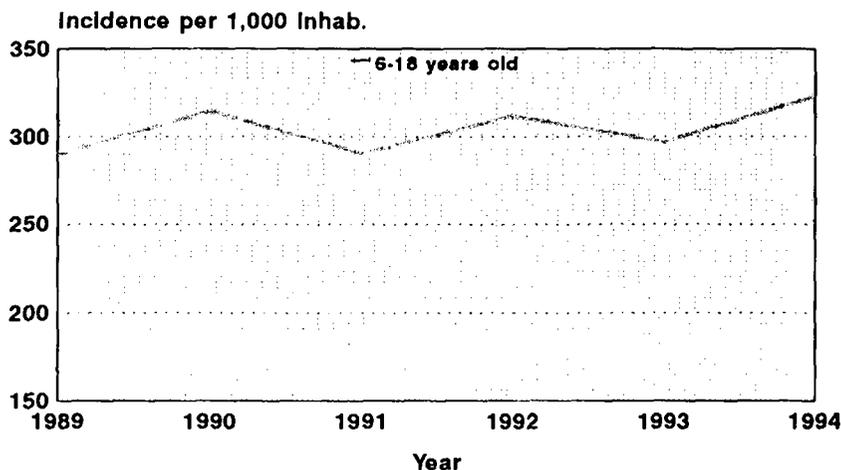
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Glostrup municipality 1989-1994 Home and leisure accidents



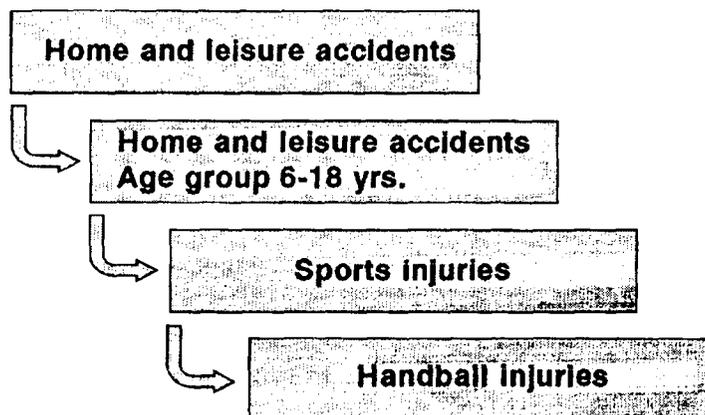
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Glostrup municipality 1989-1994 Home and leisure accidents. Age group 6-18 yrs.



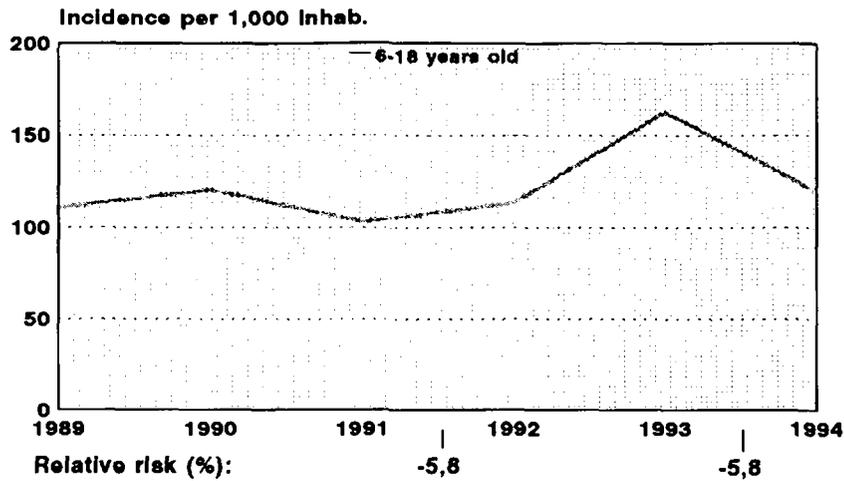
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Specifying the target group:



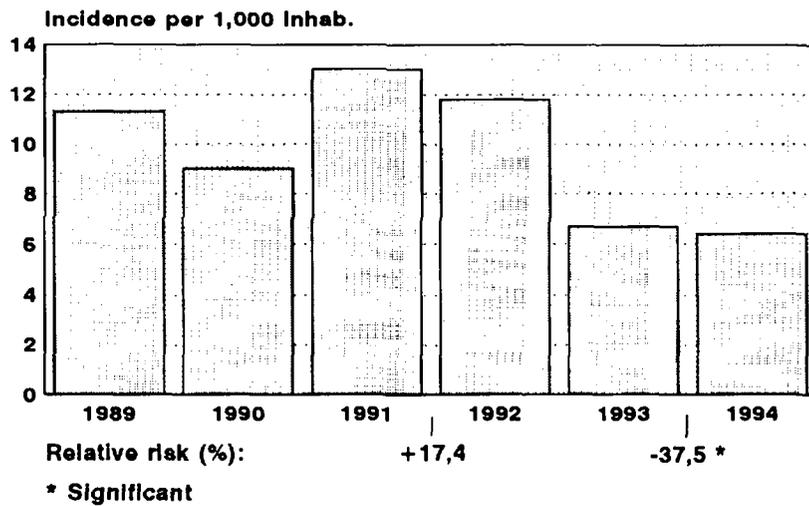
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**Glostrup municipality 1989-1994
Sports Injuries. Age group 6-18 yrs.**



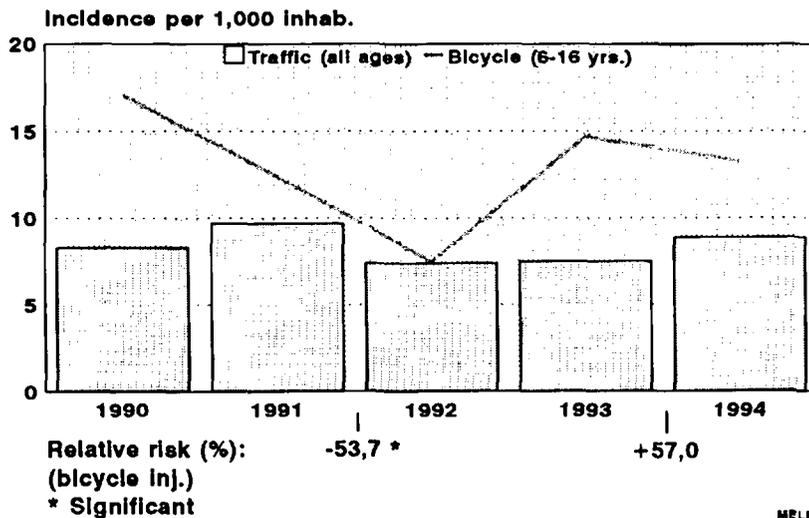
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**Glostrup municipality 1989-1994
Handball injuries. Age group 6-18 yrs.**



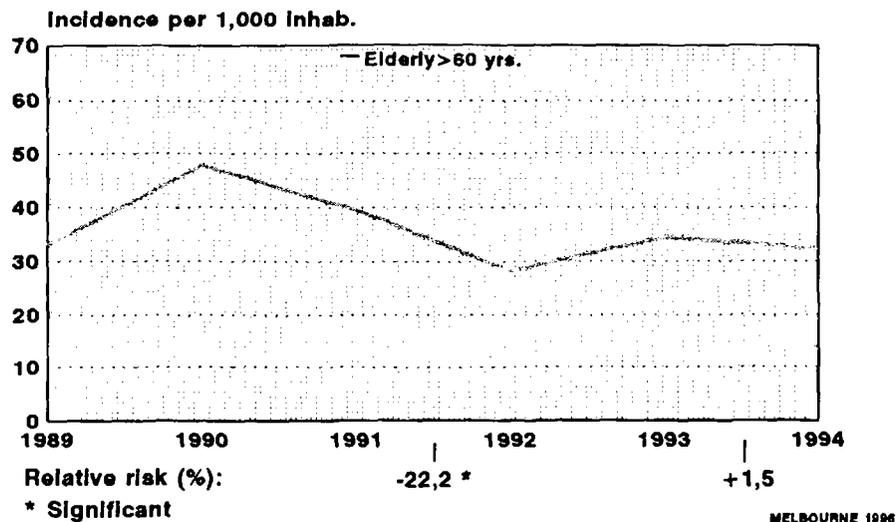
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**Nørhald municipality 1990-1994
Traffic injuries (all ages). Bicycle Injuries (6-16 yrs.)**



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Frederikssund municipality 1989-1994
Elderly >60 yrs., Injuries due to falls in homes, nursing homes, streets



Conclusions

- A multiaxial classification of external causes of injuries is the instrument of choice for targeted injury prevention
- Injury prevention is strengthened, when target groups are specified
- Successful outcome of targeted prevention sustains community participation
- Injury prevention facilitates the community intervention strategy